



March 16, 2020

VIA IBFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Written Ex Parte Presentation*
IBFS File No. SAT-LOA-20190704-00057; Call Sign S3051

Dear Ms. Dortch:

On March 12, 2020, Julie Zoller, Kalpak Gude, Mariah Dodson Shuman, Darren Achord, and David Kaufman of Amazon, along with Trey Hanbury of Hogan Lovells US LLP, spoke by telephone with Jose Albuquerque, Jay Whaley, Alan Thomas, and Paul Blais of the Satellite Division of the Commission's International Bureau.

During the meeting, Amazon's representatives explained how quickly and effectively the Kuiper System will deliver competitive high-capacity, low-latency broadband in the U.S. and around the globe, and urged the Division to expeditiously grant Amazon's application to launch and operate a non-geostationary satellite orbit fixed-satellite service ("NGSO FSS") system comprised of 3,236 satellites.¹ Amazon has comprehensively addressed the comments of various parties in this proceeding,² and the record demonstrates that the Kuiper System satisfies all of the Commission's requirements for grant of authority to operate on the same terms as approved NGSO FSS systems without commencing a new processing round. Amazon's representatives said new entrants must have a fair and equitable opportunity to compete, because the regulatory environment affects the quality of broadband services the Kuiper System can deliver to

¹ See Application of Kuiper Systems LLC for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in Ka-band Frequencies, IBFS File No. SAT-LOA-20190704-00057 (filed July 4, 2019) ("Application").

² See, e.g., Consolidated Opposition and Response of Kuiper Systems LLC, IBFS File No. SAT-LOA-20190704-00057 (filed Nov. 13, 2019) ("Opposition"); Letter from Mariah Dodson Shuman, Corporate Counsel, Amazon, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-LOA-20190704-00057 (filed Jan. 27, 2020) ("Amazon Jan. 27 Letter"). For example, Amazon has already addressed in full the substance of SES's latest submission, which repeats objections that have already been raised in the record and addressed by Amazon. See Letter from Will Lewis, Senior Legal Counsel, SES, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-LOA-20190704-00057 (filed Mar. 11, 2020).

customers and the significant investments required for deployment. Amazon also responds below to information recently provided by SpaceX in this proceeding.³

I. AMAZON IS COMMITTED TO COORDINATING IN GOOD FAITH.

NGSO FSS operators must coordinate in good faith.⁴ Amazon has continually emphasized its willingness and ability to engage collaboratively with other operators in good-faith coordination.⁵ In response to SpaceX's continued focus throughout this proceeding on simulations in which good-faith coordination does not occur,⁶ Amazon reiterates that simulations without coordination were included in its technical analysis to highlight the drastic improvement in the interference environment when, in accordance with Commission rules, good-faith coordination and information sharing does occur, which allows systems to coexist without harmful interference.⁷

SpaceX's reliance on *Teledesic* is misplaced,⁸ especially given the significant leaps in technology that have transformed the spectrum-sharing capabilities of NGSO systems. While additional satellites may create *geometric in-line events* between satellites and earth stations, the only *geometric events that have the potential to cause interference* are those that use the same frequencies at the same point on the earth in the same direction at the same time. Since co-frequency operation is limited to SpaceX gateways, which will be at individually licensed locations, providing the information needed to identify potential in-line interference events to engage in coordination should be straightforward. When it has found coordination works to its benefit, SpaceX has taken a much more optimistic approach to the coordination requirement,

³ See Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-LOA-20190704-00057 (filed Feb. 20, 2020) ("SpaceX Feb. 20 Letter").

⁴ See 47 C.F.R. § 25.261(b).

⁵ See Consolidated Opposition and Response of Kuiper Systems LLC, IBFS File No. SAT-LOA-20190704-00057 at ii (filed Nov. 13, 2019) ("Opposition") ("The Kuiper System is designed to facilitate coordination and spectrum sharing on par with other Ka-band NGSO FSS systems. The Kuiper System's small spot beams, satellite diversity, flexible network control, and dynamic channel reassignment capabilities will enable Amazon to work with other Ka-band NGSO FSS system operators to reach sharing arrangements through mutual commitment to good faith coordination, unlocking greater reuse of the Ka-band spectrum."); see also Letter from Mariah Dodson Shuman, Corporate Counsel, Amazon, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-LOA-20190704-00057 at 2, 18, 24 (filed Jan. 27, 2020) ("Amazon Jan. 27 Letter").

⁶ See Amazon Jan. 27 Letter at 13 (explaining that SpaceX assumes no good-faith coordination occurs and selectively highlights Amazon's data to hypothesize that grant of the Application would lead to an increase in interference); see also SpaceX Feb. 20 Letter at 2-3, 5.

⁷ See Amazon Jan. 27 Letter at 13-15.

⁸ See SpaceX Feb. 20 Letter at 2, n.4.

noting that NGSO operators can reach “reasonable and functional coordination agreements on how to share spectrum during in-line events.”⁹

II. THE KUIPER SYSTEM WILL SHARE SPECTRUM EFFECTIVELY WITH OTHER OPERATIONS, INCLUDING SPACEX.

Amazon has explained that the simulation results it submitted are conservative and based upon assumptions that, if anything, overstate the percentage of time that interference could theoretically occur.¹⁰ Amazon corrects the record below regarding points recently raised by SpaceX.

- **SpaceX’s Selective Use of Data.** SpaceX again raises an unfounded concern regarding the uplink analysis previously provided by Amazon,¹¹ despite Amazon’s recent showing of how SpaceX has selectively used data to misrepresent the outcome.¹² In its latest submission, SpaceX persists in misreading a table filed by Amazon in November 2019 that demonstrates the positive impact of good-faith coordination. As Amazon previously explained, the entries SpaceX cites represent values calculated under the assumption that no information sharing or coordination would occur.¹³ However, the very same table demonstrates a reduction in potential interference events when good-faith coordination occurs.¹⁴
- **Amazon’s Highly Conservative Assumptions.** The simulation model Amazon used included a number of highly conservative assumptions, including co-location of all earth stations of all NGSO systems in the simulations.¹⁵ While co-location will certainly occur in some instances, in general *all* earth stations of *all* NGSO systems will not be co-located. Amazon used a very conservative assumption about earth station co-location and still demonstrated that the Kuiper System would have no material impact on the operations of SpaceX and other NGSO operators when good-faith coordination occurs.¹⁶ And when earth stations are not co-located, the spectrum sharing environment improves.

⁹ Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, IBFS File Nos. SAT-LOA-20161115-00118 *et al.*, at 1 (filed Feb. 4, 2020).

¹⁰ *See, e.g.*, Opposition at 22, n.67, T5; Amazon Jan. 27 Letter at 2.

¹¹ *See* SpaceX Feb. 20 Letter at 6.

¹² *See* Amazon Jan. 27 Letter at 10-15.

¹³ *See id.* at 13.

¹⁴ *See id.*

¹⁵ *See* Opposition at T-5 (assuming earth stations of the examined system and the Kuiper System are always co-located, which maximizes the potential impact of interference events).

¹⁶ *See* SpaceX Feb. 20 Letter at 5.

- **Gateway Coordination.** SpaceX vaguely asserted that coordination with Amazon will prove difficult because “a large number of” SpaceX gateways “will use all Ka-band frequencies at all times,” making a large number of in-line events “inevitable.”¹⁷ Good-faith coordination, as Amazon previously stated, which includes knowing which gateway is communicating with which satellites in which frequency bands, will enable potential in-line interference events to be avoided.¹⁸ Amazon also noted in its recent filing that gateway earth stations are easier to coordinate than ubiquitous customer terminals.¹⁹ The comparatively fewer gateway earth stations that will be operating in Ka-band than ubiquitous customer terminals further supports Amazon’s showing that coexistence between the Kuiper System and other NGSO operators is achievable through good-faith coordination.
- **Power Flux-Density (“PFD”) Limit Compliance.** SpaceX again expressed unfounded concern about Amazon’s presentation of its PFD data.²⁰ Such concern continues to have no merit, given that Amazon has demonstrated compliance with the PFD limits in the FCC rules and Article 21 of the ITU Radio Regulations.²¹ The ITU issued a “favourable” finding under No. 11.31 of the Radio Regulations with respect to No. 21.16 of the Radio Regulations and compliance with the applicable PFD limits in Article 21.²²

III. AMAZON HAS SATISFIED BOTH THE WAIVER STANDARD AND THE COMMISSION’S CASE-BY-CASE FRAMEWORK FOR SPECTRUM SHARING.

The circumstances presented by Amazon weigh in favor of individual processing under the Commission’s case-by-case treatment. In the *NGSO FSS Order*, the Commission stated it would consider:

- the situation at the time,
- the need to protect existing expectations and investments,
- the need to provide for additional entry,
- comments filed by incumbent operators, and
- reasoning presented by the new applicant.²³

¹⁷ SpaceX Feb. 20 Letter at 6.

¹⁸ See SpaceX Feb. 20 Letter at 7-8.

¹⁹ See Amazon Jan. 27 Letter at 7-12.

²⁰ See SpaceX Feb. 20 Letter at 7.

²¹ See Opposition at 26-27, n.73.

²² See ITU-BR, CR/C/5024, CR/C/5025, CR/C/5026 (Sept. 17, 2019) (issuing Amazon a “favourable” rating for its proposed system).

²³ See *NGSO FSS Order* ¶ 61.

Given (1) Amazon's significant commitment to the Kuiper System, especially noting the operators that are exiting the previous processing round,²⁴ (2) Amazon's ability to operate without degrading the operations of previously authorized NGSO systems when good-faith coordination occurs,²⁵ (3) the additional competition that results from Amazon's inclusion in the spectrum-sharing regime that applies to existing NGSO operators,²⁶ (4) the comments by other NGSO operators that have been addressed by Amazon,²⁷ and (5) the depth and scope of reasoning presented by Amazon, the "necessarily [...] case-by-case" treatment of the Application leads to spectrum sharing pursuant to the terms of 25.261(c).²⁸

Amazon anticipates that future NGSO entrants will provide their own technical analysis to support the required case-by-case showing. Amazon has consistently stated that future applicants may address the same factors defined by the Commission for case-by-case treatment to show how their systems will not materially affect the NGSO FSS operational environment.²⁹ Amazon is prepared to coordinate with any future applicant who demonstrates a capacity to work collaboratively to ensure that all authorized NGSO FSS systems can effectively serve their customers.³⁰

Further, Amazon has provided a robust showing that waiver of the processing round rule is warranted in these circumstances and is consistent with Commission precedent.³¹ A new processing round, as some in this proceeding have proposed, is unnecessary in light of the Kuiper System's demonstrated spectrum sharing capabilities.

Waiver will achieve the public interest benefit of bringing Amazon's new services to U.S. consumers faster and more efficiently than would otherwise be possible if the Kuiper System were relegated to an unpredictable additional processing round. The key to unlocking this public interest benefit in the near-term is found in Amazon's largely unchallenged technical showing, which demonstrates that the Kuiper System will have no material impact on the operations of previously authorized NGSO systems when, as required by the Commission's

²⁴ See Application, Legal Narrative at 6; Opposition at 2, 15; Amazon Jan. 27 Letter at 23-24.

²⁵ See Application, Technical Appendix at Annex C; Opposition at 9-27, T1; Amazon Jan. 27 Letter at 2-15, 18-24.

²⁶ See Application, Legal Narrative at 12, 14; Opposition at 12; Amazon Jan. 27 Letter at 22-24.

²⁷ See generally Opposition; Amazon Jan. 27 Letter at 2, 24.

²⁸ *NGSO FSS Order* ¶ 61; see also Application, Legal Narrative at 10-16; Opposition at 9-15; Amazon Jan. 27 Letter at 18-21.

²⁹ See Opposition at 6; Amazon Jan. 27 Letter at 15.

³⁰ Amazon Jan. 27 Letter at 15.

³¹ See Opposition at 4-8; Amazon Jan. 27 Letter at 21-24.

rules, good-faith coordination occurs.³² Commission precedent supports waiver of a new processing round in such circumstances.³³

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Prompt grant of the Application, consistent with longstanding Commission precedent, would facilitate near-term deployment of affordable, high-capacity, low-latency broadband to unserved and underserved consumers in the United States and worldwide. Amazon remains committed to coordinating in good faith and ensuring that the Ka-band NGSO FSS operational environment allows existing operators and future entrants to bring their important services to people everywhere.

Respectfully submitted,

/s/ *Mariah Dodson Shuman*
Mariah Dodson Shuman
Corporate Counsel
Kuiper Systems LLC,
an Amazon subsidiary

³² See Opposition at 20, 24, Technical Appendix; Amazon Jan. 27 Letter at 2-7.

³³ The Commission may waive any of its rules for “good cause” and generally does so where—as is the case here—the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest. See 47 C.F.R. § 1.3; *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969).